west virginia department of environmental protection

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Charleston, WV December 21st, 2009

Penn Virginia Oil & Gas Corporation
GEOMET, Inc.
Surface Owners' Rights Organization
Independent Oil and Gas Association of West Virginia, Inc. – IOGA
Mr. George Monk and Mrs. Molly Schaffnit
General Public and Interested Parties

Ref.: Response to comments made to the General Permit GP-WV-1-07. CBM Land Application.

Dear Madam/Sir

The Office of Oil and Gas – OOG has reviewed the comments received within the 90 days comment period established for the renewal of the permit cited in the reference. The comment period expired on October 6th, 2009.

Our response to each of your comments follows:

Commenter: Penn Virginia

Comment 1. *Change H.12 on the basis of "no proven reports of groundwater contamination as a result of land application pursuant to the current version of the permit".*

Answer: The current permit does not consider exhaustive methods to determine if groundwater quality has been affected as a result of the permitted activity. According to reports submitted to DEP by the operators covered by the permit, there is no evidence of contamination or alteration of groundwater's quality; however, DEP considers the data insufficient to determine there has not been an impact because any effect the springs and seeps that are currently monitored may not correlate to any effect on aquifers.

The permit has been modified. Number H.12(c) has been added to allow operators to propose alternatives in their permit application that will be considered on a case-by-case basis.

Commenter: Geomet

Comment 1. *Change of permit fee.*

Answer: The per year permit fee has not changed from $750 per year. The current permit fee is $1500 for a 2 year permit, or $750 per year. The new permit is a 5 year permit, for a total fee of $3,750.

$750/year x 2 years = $1500
$750/year x 5 years = $3750

Additionally, DEP-OOG considers that a variable rate according to the number of wells is necessary to support the program's expenses. Wells are now considered part of the discharging system (See maintenance plan – Number E.1) and this office will need additional resources to perform field inspections on facilities and sites with several wells associated to them.

Finally, more resources are needed since OOG plans to carry on new studies to enhance the permit's performance (See response to comment 4).

Comment 2. *Discharge limitations. GEOMET recommends that the current default limits, under the current permit, at a minimum, be maintained.*

Answer: The proposed standards are considered to be protective of groundwater, vegetation and soil in areas where discharges occur. DEP agrees with the comment.

However, based on data provided by operators during the period this permit has been used, and according to studies performed by DEP-OOG, there is an average ratio between TDS and Chlorides for this water of 5.57:1. This means that a more realistic approach is to raise TDS limit from 500 to 1000 mg/L.

TDS with 1000 mg/L (Using a ratio of 4.0:1) still will guarantee that the buffer capacity of soils in WV will keep TDS from impacting groundwater that can be potentially used as drinking water source.

Comment 3. *Discharge limitations. TDS is not a parameter for NPDES permits.*

Answer: Total Dissolved Solids (TDS) is an expression of the combined content of all inorganic and organic substances contained in a liquid which are present in a molecular, ionized or micro-granular (colloidal sol) suspended form. The most common constituents are calcium, phosphates, nitrates, sodium, potassium and chloride. Monitoring TDS will help prevent groundwater, soils and vegetation from being impacted adversely.

Comment 4. *Monitoring requirements. New parameters required; please explain.*

Answer: The DEP is planning to perform SAR and Conductivity studies on soils in order to better understand the effects the discharged water may have. Monitoring calcium, magnesium, potassium, sodium and barium are required under the new permit because these parameters will provide key information for such studies.

Concentration in mg/L will be required for new parameters.

Comment 5. *Monitoring requirements. Remove metals from the current permit because they are below detectable limits.*

Answer: In most cases, these parameters are under detectable limits for the waters discharged under this permit; however, the DEP finds it necessary to monitor them and avoid risks from new operations.

The agency agrees with your comment. Thus the permit has changed to reflect this concern by adding the following:

> F.3 (b). Metals (Al, Fe, Se, Mn and Hg) will be monitored with the same frequency of other parameters during the first year from the date the authorization to discharge under this permit is granted; the parameters that consistently show values "Below Detection Limit" (BDL) will be subject to a different monitoring frequency upon operator's request to the chief. After request is granted, such metals will be monitored and reported to DEP with the same frequency used for the soil and vegetation studies. Metals that are not BDL or which request to change frequency has not been granted will be monitored with the initial frequency (monthly).

Comment 6. *Remove the requirement to analyze mercury by method 1669. This method is not suitable for wastewater samples (It is designed for gently flowing streams or lakes). No lab in WV uses this method.*

Answer: The methods proposed in the permit are: 245.7 and 1631.

EPA's groundwater standard is 2ng/L. Since the permit addresses the potential contamination of groundwater, the DEP considers that the testing method needs to have a Method Detection Level less than 2ng/L.

Commenter: Surface Owners' Rights Organization

Comment 1. *The applied water can percolate and affect Groundwater*

Answer: In order to avoid potential contamination to groundwater, DEP is requiring additional groundwater studies. The number H.3 in the permit establishes that if any contamination is suspected or demonstrated, the operator shall stop discharges of water immediately.

Comment 2. *The permit should not allow land application within 1000 feet of any stream and no karst topography.*

Answer: The permit currently prohibits any discharge to any stream. It also prohibits runoff outside the application area. The agency considered that no land application in karst topography can be allowed and appropriate changes have been made to the permit.

Comment 3. *The permit provides no data regarding the amount of produced water from CBM wells.*

Answer: In Section B, the permit requires the operator to provide volumetric data on a monthly basis. Also, the expected volume of produced water is related to the permeability of soils during the application process. This addresses the volume an operator can discharge over a certain area under particular circumstances.

Comment 4. *No rational for the proposed permit.*

Answer: A rationale is attached to the final permit and the answers to the comments.

Comment 5. *The treatment system is left entirely to the operator.*

Answer: The agency believes that an approach based on results will offer more flexibility to operators to choose from different workable alternatives.

Comment 6. *Relying on gross soil type determinations of a NRCS soil map is not a good option.*

Answer: The permit clearly establishes for the operator to avoid any runoff outside the permitted area. This limitation and the use of NRCS data have proven to be useful for these sites. Since the agency issued the permit, no findings of runoff toward surface waters have been made.

Comment 7. *No groundwater monitoring is required for facilities operating within lower limits*

Answer: The lower limits are essentially primary and secondary standards; therefore there is no need to do any groundwater monitoring for those. Additionally, the permit encourages operators to analyze the cost-benefit of different disposal alternatives.

Comment 8. *The permit should not allow the intentional by-pass*

Answer: The agency believes that the conditions for such by-pass are very specific in the permit. A by-pass can be allowed if the effluent meets the requirements stated in the permit.

Comment 9. *Fee is too low. Operator should pay fee for each well*

Answer: The DEP considers that this fee is fair to all interested parties, and takes into account the costs incurred by the agency for this program during the period established by the permit (5 years).

Comment 10. *No requirement for the operator to report volume of wastes. This should be mandatory.*

Answer: The agency believes that this information does not help to improve the permit's performance and it is onerous for DEP and operators as well.

As a standard procedure, reviews of all records required to be kept under the permit are performed randomly in order to ensure compliance (Conditions D.11 and E.5 in the permit).

Commenter: IOGA

Comment 1. *Remove H.12.*

Answer: The current permit does not consider exhaustive methods to determine if groundwater quality has been affected as a result of the permitted activity. According to reports submitted to DEP by the operators covered by the permit, there is no evidence of effect on groundwater quality; however, DEP considers the data insufficient to determine there has not been an impact because any effect the springs and seeps that are currently monitored may not correlate to any effect on aquifers.

The permit has been modified. Number H.12(c) has been added to allow operators to propose alternatives in their permit application that will be considered on a case-by-case basis.

Comment 2. *Permit fee.*

Answer: The per year permit fee has not changed from $750 per year. The current permit fee is $1500 for a 2 year permit, or $750 per year. The new permit is a 5 year permit, for a total fee of $3,750.

$750/year x 2 years = $1500
$750/year x 5 years = $3750

Additionally, a variable rate according to the number of wells is necessary to support the program's expenses. Wells are now considered part of the discharging system (See maintenance plan – Number E.1) and DEP will need additional resources to perform field inspections on facilities and sites with several wells associated to them.

Finally, more resources are needed since DEP plans to carry on new studies to enhance the permit's performance (See response to comment 4).

Comment 3. *New parameters required.*

Answer: The DEP is planning to perform SAR and Conductivity studies on soils in order to better understand the effects the discharged water may have. Monitoring Calcium, Magnesium, Potassium, Sodium and Barium are required under the new permit because these parameters will provide key information for such studies.

Concentration in mg/L will be required for new parameters.

Comment 4. *Discharge limitations. IOGA opposes to discharge limitations stated in the permit because there is not groundwater quality standards for WV. These standards need clarification.*

Answer: A reason for this permit is to avoid potential contamination of waters that can be used as drinking sources now or in the future.

A rationale is attached to the final permit and the answers to the comments. No changes in limits will be granted without additional studies.

Comment 5. *Transition period. Remove "and obtain" from D.2.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 6. *Transition period. Extend transition period from 60 to 90 days.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 7. *Extend time for dismantling from 6 months to 12 months.*

Answer: DEP considers that 6 months is enough time to make a decision to dismantle the discharging facility and remove equipment from site.

Comment 8. *Soil and vegetation studies. Clarify that the soil and vegetative studies referenced in F.3 are to be conducted in the spring and fall seasons of the year and be submitted thereafter. Please confirm IOGA's understanding that studies conducted at least 5 months apart, but within the specified spring and fall seasons, will be the requirements of the permit.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 9. *Soil and vegetation studies. Modify language to allow for soil and/or vegetative studies of parcels adjacent to the proposed land application area to be submitted as the baseline studies required by the permit so long as the adjacent areas are representative of the application area. An operator who is planning to operate two land application sites could then satisfy the baseline requirement with a single study, thereby reducing the cost to the permitee, while still providing DEP with meaningful information.*

Answer: The baseline study must be performed for the selected control area. This area needs to be adjacent to the permit application area in order to accurately measure the impacts of land application on soils and vegetation.

Corollary: The selected site for land application must have an adjacent area with characteristics that are representative of the application area.

Commenter: Mr. George Monk and Mrs. Molly Schaffnit

Comment 1. *Include definition of "waters of the state" to clarify its use in E.6 and H.1.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 2. *Add mg/L for new parameters.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 3. *Remove final quotation mark in F.1.c.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 4. *Fix language in F.3.a.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 5. *F.4. Effective pH monitoring can be performed only by using a properly calibrated meter.*

Answer: DEP considers that field kits for measurement of pH are adequate. Field kits give a good approach so far.

Comment 6. *H.2. The land application area boundary should be at least 1000 feet from a domestic water supply.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 7. *H.9. 25-foot down gradient boundary is not protective enough.*

Answer: The agency deems that the 25-foot down gradient boundary is adequate. The waters discharged under this permit have low chloride levels that can be managed by the environment. This fact has been demonstrated by the data provided to the agency during the past two years.

Comment 8. *H.10. We believe "35CSR1.7" should be clarified and amplified.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit.

Comment 9. *Additional Requirements. Gel fracturing that utilizes diesel, or a product with similar organic carbon range, should be an exclusionary factor for receiving a General Permit for land application.*

Answer: The agency has agreed with your comment and appropriate changes have been made to the permit. To the DEP's knowledge, this is not a current practice for fracturing coal bed methane wells in WV. The permit will not be granted for produced water from wells which have been fractured by using diesel or hydrocarbons with the potential of remaining in the formation.

The OOG and the Division of Water and Waste Management of the West Virginia Department of Environmental Protection wish to thank you for your concerns and comments on this matter.

Other documents enclosed:

- Fact Sheet, Rationale and information for General Permit GP-WV-1-07.
- General Permit GP-WV-1-07.

Sincerely,

JAMES MARTIN
OOG - CHIEF

Copy: OOG